

PUBLIC HEALTH Bulletin



COUNTY OF ORANGE • HEALTH CARE AGENCY

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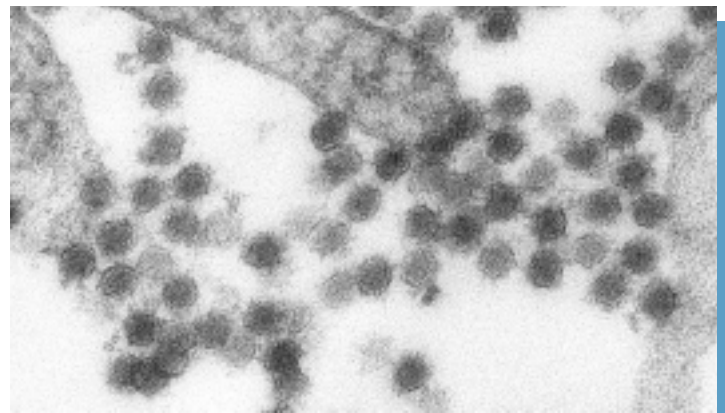
West Nile Virus—an emerging threat in 2004

Based on information from The Centers for Disease Control and Prevention and the Orange County Health Care Agency Public Health Services, Epidemiology and Assessment.

West Nile Virus (WNV) is transmitted by the bite of infected mosquitoes. Some species of wild birds appear to be the natural reservoir for this virus, although some birds, such as crows, have high mortality rates. WNV arrived in California in 2003, and the first locally acquired case in the state, a 31 year-old Riverside man with aseptic meningitis, was reported in early October of 2003. Although Vector Control organizations have been preparing for WNV for some time, it is possible that we could have a significant epidemic this coming summer.

WNV was first identified in the United States in the summer of 1999 in New York City where it was found in a 75-mile radius centered in Queens. Since 1999, WNV has moved westward rapidly. In 2002, there were 4156 confirmed cases (approximately 80% had CNS involvement) and 284 deaths. In 2002 for the first time transmission was shown to have occurred by transplantation, transfusion, vertically (mother to fetus), through breastfeeding and occupationally. Almost 9,000 cases of WNV infection were reported in 2003 with 218 deaths. Cases reported

from the states of Colorado, Nebraska and South Dakota represented 59% of the total. Of the 8977 cases reported, 6082 cases (68%) were reported as West Nile Fever (milder disease), 2577 (30%) were reported as West Nile meningitis or encephalitis (severe disease) and 205 (2%) were clinically unspecified.



An electron micrograph of the West Nile virus.

Clinical Features of West Nile Virus

Mild Infection:

Most WNV infections are mild and often clinically unapparent.

- Approximately 20% of those infected develop a generally mild illness (West Nile fever).
- The incubation period is thought to range from 3 to 14 days.
- Symptoms generally last 3 to 6 days.

Reports from earlier outbreaks describe the mild form of WNV infection as a **febrile illness of sudden onset** often accompanied by:

- malaise
- headache
- anorexia
- myalgia
- nausea
- rash
- vomiting
- lymphadenopathy
- eye pain

The full clinical spectrum of West Nile fever has not been determined in the United States.

Severe Infection:

Approximately 1 in 150 infections will result in severe neurological disease.

- The most significant risk factor for devel-

oping severe neurological disease is advanced age.

- Encephalitis is more commonly reported than meningitis.

In recent outbreaks, symptoms occurring among patients hospitalized with severe disease include:

- fever
- gastrointestinal symptoms
- weakness
- change in mental status
- A minority of patients with severe disease developed a maculopapular or morbilliform rash involving the neck, trunk, arms, or legs.
- Several patients experienced severe muscle weakness and flaccid paralysis.
- Neurological presentations included:
 - ataxia and extrapyramidal signs
 - optic neuritis
 - cranial nerve abnormalities
 - polyradiculitis
 - myelitis
 - seizures

Although not observed in recent outbreaks, myocarditis, pancreatitis, and fulminant hepatitis have been described.

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WNV (Continued from Page 1)**Clinical Suspicion**

Diagnosis of WNV infection is based on a high index of clinical suspicion and obtaining specific laboratory tests.

- WNV, or other arboviral diseases such as St. Louis encephalitis, should be strongly considered in adults >50 years who develop unexplained encephalitis or meningitis in summer or early fall.
- The local presence of WNV enzootic activity or other human cases should further raise suspicion.
- Obtaining a recent travel history is also important.

Note: Severe neurological disease due to WNV infection has occurred in patients of all ages. Year-round transmission is possible in some areas. Therefore, WNV should be considered in all persons with unexplained encephalitis and meningitis.

Laboratory findings among patients in recent outbreaks

- Total leukocyte counts in peripheral blood were mostly normal or elevated, with lymphocytopenia and anemia also occurring.
- Hyponatremia was sometimes present, particularly among patients with encephalitis.
- Examination of the cerebrospinal fluid (CSF) showed pleocytosis, usually with a predominance of lymphocytes.
- Protein was universally elevated.

- Glucose was normal.
- Computed tomographic scans of the brain mostly did not show evidence of acute disease, but in about one-third of patients, magnetic resonance imaging showed enhancement of the leptomeninges, the periventricular areas, or both.

Diagnostic Laboratory Testing

The IgM antibody to WNV appears in CSF as early as the first few days of illness. Paired acute (0-8 days after onset) and convalescent (14-21 days after the acute specimen) serum specimens are used to demonstrate seroconversion. A negative IgM on acute phase serum does not rule out WNV infection. IgM antibody can persist in serum for 12 months or longer and is, therefore, not necessarily diagnostic of acute infection. For these reasons, CSF IgM and acute and convalescent phase serum for IgG antibody are most useful for diagnosing WNV infection.

Because of cross-reactions with other flaviviruses (including in persons recently vaccinated against or infected with yellow fever, Japanese encephalitis, dengue) confirmation by a neutralization assay is necessary to confirm the diagnosis. In fatal cases, brain tissue, heart blood and buffy coat samples can be submitted. Polymerase chain reaction (PCR) tests of CSF are not sensitive enough to be relied upon for diagnosis and should not replace tests for WNV antibody in CSF and serum. Orange County Epidemiology may be able to assist with testing

and confirmation—call (714) 834-8180.

Reporting Suspected WNV Infection

Surveillance for human WNV infection consists of reporting all hospitalized cases of encephalitis of unknown etiology and testing of these patients for WNV or Saint Louis encephalitis. Encephalitis of suspected infectious cause is a reportable condition under California law. Cases should be reported promptly to Orange County Epidemiology at (714) 834-8180.

The timely identification of persons with acute WNV or other arboviral infection may have significant public health implications and will likely augment the public health response to reduce the risk of additional human infections.

Treatment

Treatment is supportive, often involving hospitalization, intravenous fluids, respiratory support, and prevention of secondary infections for patients with severe disease.

- Ribavirin in high doses and interferon alpha-2b were found to have some activity against WNV in vitro, but no controlled studies have been completed on the use of these or other medications, including steroids, antiseizure drugs, or osmotic agents, in the management of WNV encephalitis.

Control measures

The most effective means for limiting the risk of WNV infection is through elimination of mosquito breeding sites, including even small amounts of standing water. Additional preventive measures include avoiding outdoor activity at the time when mosquitoes are most active (dawn and dusk), using mosquito repellent, and assuring that window and door screens are in good condition.

Additional West Nile Virus Resources

- The Centers for Disease Control and Prevention
<http://www.cdc.gov/ncidod/dvbid/westnile/index.htm>
- California West Nile Surveillance Information Center
<http://www.westnile.ca.gov/>
- Orange County Vector Control District
<http://www.ocvcd.org/>
- Medline Plus Health Information
<http://www.nlm.nih.gov/medlineplus/westnilevirus.html>

For additional clinical information, please refer to Petersen LR and Martin AA, "West Nile Virus: A Primer for the Clinician [Review]" Annals of Internal Medicine (August 6) 2002;137:173-9. PDF (287 KB/7 pages)



Culex quinquefasciatus, the southern house mosquito, is one of several mosquitoes found in Orange County that may be capable of transmitting West Nile virus. Females are active nearly year-around in the more sheltered areas of the county and will frequently enter houses to seek blood. Larvae are commonly associated with all types of "urban waters" held in sources ranging from swimming pools to flower pots. This species may also serve as both our primary and secondary vector of St. Louis encephalitis (SLE) virus.

California leads the nation in Trichinellosis cases

California had the highest number of reported trichinellosis cases from 1997-2001, according to a recent surveillance summary in the CDC's *Morbidity and Mortality Weekly Report* (MMWR). During the five-year period, California reported 21 of the 72 documented cases in the United States (29%). While there has been a steady decline in the reported incidence of the disease, an interesting change has occurred in its epidemiology.

Trichinellosis is a parasitic disease caused by tissue-dwelling roundworms of the species *Trichinella spiralis*. The organism is acquired by eating inadequately cooked *Trichinella*-infected meat products. Trichinellosis has a broad clinical presentation ranging from asymptomatic to fatal. Initial symptoms of abdominal pain, vomiting, diarrhea, constipation and low-grade fever may occur within one week of ingestion of infected meat. These symptoms may be followed in one to eight weeks by facial edema, peripheral edema, headaches, intermittent fever, conjunctivitis, rashes, pruritus, cough, myalgia and eosinophilia, as the larvae migrate through the tissues and encyst in the muscles. Fatal cases might result from neurologic and myocardial complications.

Fifty years ago, the median average number of cases in the United States approached 400, with 57 trichinellosis-related deaths. By 1997-2001, the incidence decreased to a median of 12 cases an-

nually and no reported deaths. Historically, pork products were the most commonly identified source of *Trichinella* infections in the United States. The number of cases attributed to pork has declined for many years, largely because of changes implemented by the U.S. pork industry that have resulted in reduced prevalence of *Trichinella* among domestic swine. Improved processing methods have also contributed to the dramatic decline.

Of the 72 cases reported from 1997-2001, 52 (72%) occurred among males, with the median age of patients at 45 years. While the number of reported human cases related to eating pork has decreased, the number of reported cases related to eating non-pork products has remained constant. Wild game meat was the most common source of infection during 1997-2001, with 31 of the 72 cases (43%) associated with eating wild game. Of these

31 cases, all but two were associated with eating bear meat. The other cases were associated with eating cougar or wild boar. Another 9 cases (13%) were associated with eating noncommercial pork products, such as home raised or direct from farm swine where U.S. commercial pork production standards and regulations do not apply.

The emergence of wild game meat as the most common source of trichinellosis and the continued occurrence of trichinellosis among consumers of pork obtained from small farms or other countries suggests that educational messages con-

cerning the risks for eating meat cooked improperly, especially from noncommercial sources, are not reaching those at greatest risk.

The full text of the trichinellosis surveillance report is available at [http://](http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5206a1.htm)



Electron micrographs of the *Trichinellosis* parasite.

www.cdc.gov/mmwr/preview/mmwrhtml/ss5206a1.htm.

Health Alert Network access offered to OC physicians

Orange County physicians and other health care providers will have an opportunity to register for access to the California Health Alert Network (CAHAN), a secure, web-based system designed to provide early warnings of impending or current public health emergencies or disasters. While this is a statewide system, each county has control over local alerts.

CAHAN is capable of sending alerts by e-mail, telephone, fax, alphanumeric pagers and cellphones. Each registered user sets up their own profile, allowing them to control how, where, and by what means they receive alerts. The system allows alerts to be sent at high, medium and low priority levels, depending on the nature of the situation. When an alert is distributed, users are advised to log on to the CAHAN website to read the full content of the alert. The public is not allowed access to CAHAN.

"Systems like CAHAN allow us to share sensitive information on potential or actual emergencies with the health care community," said Mark B. Horton, M.D., County Health Officer. Through CAHAN, the State and the Health Care Agency can

disseminate information on a disease threat like SARS, a potential bioterrorism incident or any other situation that requires immediate attention. "If a provider is likely to be involved in responding to a public health emergency or bioterrorism incident and wants to receive an alert about any impending situation, I would highly recommend signing up for CAHAN," said Dr. Horton.

To request CAHAN access and participation, please e-mail your contact information to Public Health Epidemiology and Assessment at epi@ochca.com or return the requested information by fax to (714) 834-8196. The contact information needed is:

- Name
- Title
- Organization
- Telephone Number
- Fax Number
- E-mail address

Your information will not be shared by the Health Care Agency with any other organization and your e-mail address will

only be used for CAHAN related communication. If you have any questions about CAHAN participation and access, please contact Howard Sutter at (714) 834-5109.

CAHAN allows users to establish their own profile for receiving alerts and can be accessed from any internet-ready computer.

Fourth Quarter (Weeks 1-53)
Number of Cases by Year of Report

DISEASE	2003	2002	2001	2000
AIDS ¹	238	263	247	309
AMEBIASIS	11	18	24	18
CAMPYLOBACTERIOSIS	245	294	262	314
CHLAMYDIA	6405	5629	5757	4575
CRYPTOSPORIDIOSIS	21	9	6	1
E-COLI O157:H7	24	17	13	30
FOOD POISONING OUTBREAKS	44	72	37	15
GIARDIASIS	124	127	170	216
GONOCOCCAL INFECTION	919	686	664	568
H-FLU, INVASIVE DISEASE	5	4	3	5
HANSEN'S DISEASE, LEPROSY	0	0	0	2
HEPATITIS A (acute)	77	91	146	245
HEPATITIS B (acute)	26	48	48	58
HEPATITIS B (chronic)	1298	1235	1530	1780
HEPATITIS B (perinatal, acute & chronic) ²	2	8	0	0
HEPATITIS C (acute)	3	10	10	4
HEPATITIS C (chronic)	1841	2166	2519	2715
HEPATITIS OTHER/UNSPECIFIED	14	17	14	21
HIV ³	538	793	NA	NA
KAWASAKI DISEASE	24	16	16	17
LISTERIOSIS	5	15	12	13
MALARIA	12	17	12	15
MEASLES (RUBEOLA)	0	2	5	1
MENINGITIS, TOTAL	648	378	310	331
ASEPTIC MENINGITIS	596	319	271	262
MENINGOCOCCAL INFECTIONS	16	9	14	22
MUMPS	3	8	2	5
NON-GONOCOCCAL URETHRITIS	554	793	656	646
PERTUSSIS	92	102	21	18
PELVIC INFLAMMATORY DISEASE	38	62	59	68
RUBELLA	0	0	0	1
SALMONELLOSIS	250	310	268	353
SHIGELLOSIS	121	177	126	197
STREP, INVASIVE GROUP A	46	57	31	33
SYPHILIS, TOTAL	262	329	233	215
PRIMARY	18	17	17	7
SECONDARY	20	14	22	21
EARLY LATENT	25	31	26	19
LATENT	11	3	8	5
LATE LATENT	182	260	159	152
CONGENITAL	3	4	1	10
NEUROLOGICAL	3	0	0	1
TUBERCULOSIS	248	230	278	246
TYPHOID FEVER, CASE	10	3	0	3

¹Source: CDC HARS Reporting System

NA= Not Available

²Previously included in Hepatitis B acute or chronic totals. Separate reporting started in 2002.³Source: CDC HARS Reporting System. 2002 numbers are from July-December. Orange County officially began HIV case reporting July 1, 2002; data is unavailable for previous years.

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